231

United States Air Force

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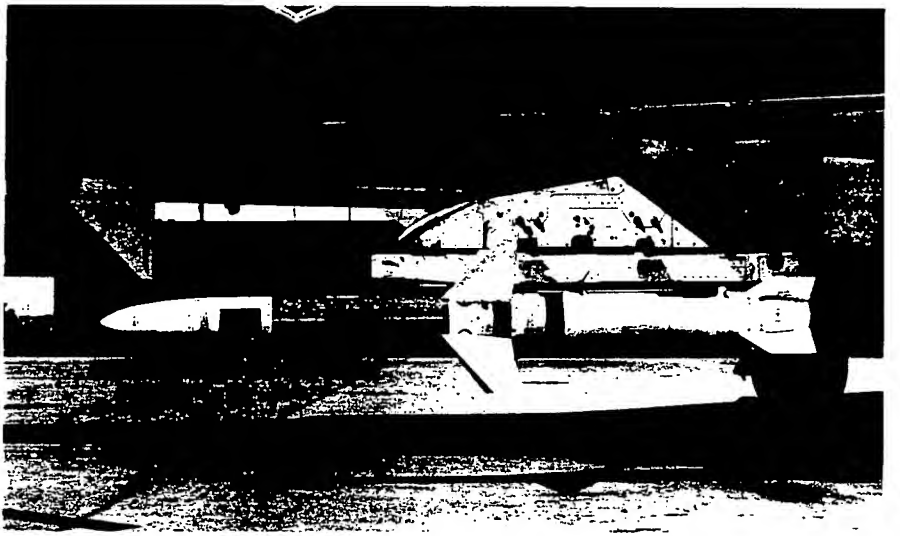

AGM-45 Shrike

The AGM-45 Shrike is a supersonic, air-to-surface, guided missile. This tactical missile is designed to detect, identify and home in on enemy radar installations.

The Shrike began operational service in the Air Force in 1965. It played an important part in the U.S. air offensive during the Vietnam War and became a standard penetration aid on tactical aircraft.

This anti-radiation missile has four sections: guidance system, warhead, control system and rocket motor. The missile has a conventional cylindrical body, pointed nose, four delta-wing control surfaces and four tail fins in a cross-like arrangement.

The AGM-45 Shrike was developed by the Naval Weapons Center and many versions have been produced for the U.S. Navy and Air Force to increase its effectiveness at combating specific threats. They primarily differ in the electromagnetic frequency coverage of the front-end, detachable seeker sections. Other modifications include a more powerful rocket motor, increased range and additional safety features.

A training version in various configurations, designated ATM-45, also is in service.

The Air Force received more than 13,000 Shrike missiles before production ended in 1978. Latest models equip the F-4E/G and F-16C/D aircraft.

Specifications

Primary function: air-to-surface anti-radiation missile
Prime contractors: Texas Instruments and Sperry Rand/ UNIVAC
Power plant/manufacturer: Rocketdyne Mk 39 or Aerojet Mk 53 solid-propellant rocket motor
Dimensions: wingspan 3.25 ft., length 10 ft., body diameter 8 in.
Warhead: 149 lb. high-explosive/fragmentation
Launch weight: 400 lb.
Guidance: passive system, homes in on electromagnetic energy
Status: operational

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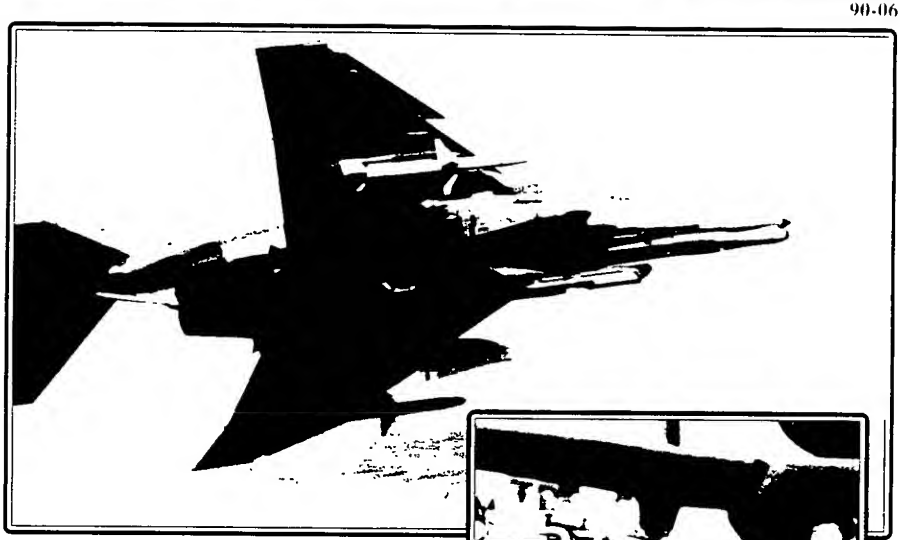

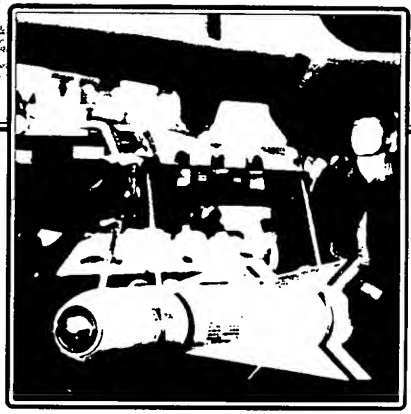

AGM-65 Maverick Missile

The AGM-65 Maverick is a tactical, air-to-surface guided missile designed for close air support, interdiction and defense suppression missions. It provides stand-off capability and high probability of strike against a wide range of tactical targets, including armor, air defenses, ships, transportation equipment and fuel storage facilities.

Background

The Maverick has a cylindrical body, and either a rounded glass nose for electro-optical imaging, or a zinc sulfide nose for imaging infrared. It also has long-chord delta wings and tail control surfaces mounted close to the trailing edge of the wing of the aircraft using it. The warhead is in the missile's center section. A cone-shaped warhead, one of two types carried by the Maverick missile, is fired by a contact fuse in the nose. The other is a delayed-fuse penetrator, a heavyweight warhead that

penetrates the target with its kinetic energy before firing. The latter is very effective against large, hard targets. The propulsion system for both types is a solid-rocket motor behind the warhead.

A-7, A-10, F-4, F-16, F-15E and F-111 aircraft carry Mavericks. Since as many as six Mavericks can be carried by an aircraft, usually in three-round underwing clusters, the pilot can engage several targets on one mission. The missile also has "launch-and-leave" capability that enables a pilot to fire it and immediately take evasive action or attack another target as the missile guides itself to the target. Mavericks can be launched from high altitudes to tree-top level and can hit targets ranging from a distance of a few thousand feet to many miles.

Models

Maverick A and B models have an electro-optical television guidance system. After the protective dome cover is automatically removed from the nose of the missile and its video circuitry activated, the scene viewed by the guidance system appears on a cockpit television screen. The pilot selects the target, centers cross hairs on it, locks on, then launches the missile.

Although the Maverick B is similar to the A model, the television guidance system has a screen magnification capability that enables the pilot to identify and lock on smaller or more distant targets.

The Maverick D has an imaging infrared guidance system operated much like that of the A and B models, except that infrared video overcomes the daylight-only, adverse weather limitations of the other system. The infrared Maverick D can track heat generated by a target, and provide the pilot a pictorial display of the target during darkness and hazy or inclement weather.

The Maverick G model essentially has the same guidance system as the D, with some software modifications that track larger targets. The G model's major difference is its heavyweight penetrator warhead, while Maverick A, B and D models employ the shaped-charge warhead.

Status

The Air Force accepted the first AGM-65A Maverick in August 1972. A total of 25,750 A and B Mavericks have been purchased by the Air Force.

The Air Force took delivery of the first AGM-65D in October 1983, with initial operational capability in February 1986. Delivery of operational AGM-65G missiles took place in 1989.

Specifications

Primary Function: Air-to-surface guided missile

Prime Contractors: Hughes Aircraft Co.; Raytheon Co.

Guidance System: AGM-65A/B electro-optical television. AGM-65D/G imaging infrared

Dimensions: Wingspan 2 ft. 4 in., length 8 ft. 1 in., diameter 1 ft.

Warheads: AGM-65A/B/D 125 lb. cone shaped. AGM-65G 300 lb. delayed-fuse penetrator, heavyweight

Launch Weight: AGM-65A/B 462 lb., AGM-65D 485 lb., AGM-65G 670 lb.

Status: AGM-65A/B operational. AGM-65D/G production/operational

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86-61

AGM-69 SHORT-RANGE ATTACK MISSILE

The AGM-69 SRAM is a supersonic air-to-surface missile. It is used by U.S. Air Force strategic bombers to neutralize enemy air defenses such as surface-to-air missile sites, and to strike heavily defended and mobile targets.

The AGM-69 can be launched without the carrier aircraft being exposed to target-area defense systems. Its range, speed and small radar image provide excellent penetration against advanced enemy air defense systems.

The AGM-69 has an inertial guidance system with terrain-avoidance capability designed so that it cannot be jammed. It is powered by a two-pulse solid-propellant rocket motor and can fly sharply curved courses to a target. The SRAM is nuclear-capable. AGM-69s are targeted aboard the aircraft immediately prior to launch and have flexibility in missile speeds and trajectories.

The missile is carried by B-52G/H, B-1B and FB-111 bomber aircraft. The B-52s can carry eight SRAMs on a rotary launcher in the rear bomb bay. The FB-111 can carry up to six AGM-69s, four on pivoting underwing pylons and two in an internal bomb bay. The B-1B can carry up to three rotary launchers of eight SRAMs for a total of 24 missiles per aircraft. The first SRAM-capable B-1B unit, located at Dyess AFB, Texas, achieved initial operational capability in September 1986.

Thirty-eight test launches of the SRAM were conducted between 1969 and 1971 from FB-111 and B-52 aircraft. The development test program was completed in July 1971, with the missile exceeding

specification requirements in terms of range, accuracy, radar cross section and reliability. Since 1971, 123 additional SRAMs were launched under the follow-on test and evaluation program. The tests demonstrated that SRAM is still one of the most reliable bomber-carried weapons.

Production of the AGM-69A began in 1971. Strategic Air Command began receiveing them in March 1972, and B-52G's of the 42nd Heavy Bombardment Wing at Loring Air Force Base, Maine, soon became operational with AGM-69s. The first FB-111 unit with AGM-69s, the 509th Bombardment Wing at Pease Air Force Base, N.H., became operational soon thereafter. Delivery of the 1,500 AGM-69 missiles ordered by the Air Force was completed in 1975.

Specifications

Primary function: air-to-surface strategic missile
Prime contractor: Boeing Aerospace Co.
Power plant/manufacturer: Lockheed Propulsion Co. LPC-415 solid-propellant, two-pulse rocket motor
Warhead: nuclear-capable
Launch weight: 2,208 lb.
Guidance: General Precision/Kearfott inertial system
Dimensions: length 14 ft., diameter 1 ft. 5 in.
Status: operational

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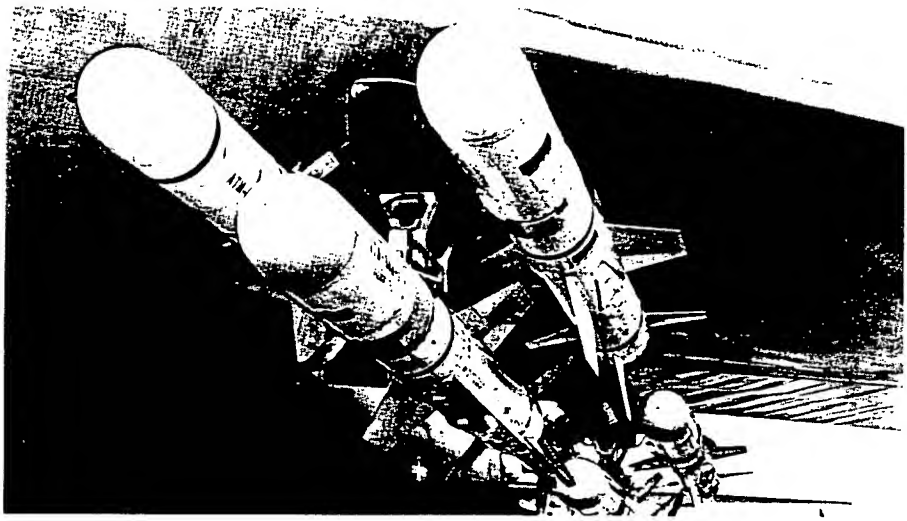

AGM-84A-1 Harpoon Missile

Harpoon is an all-weather, over-the-horizon, anti-ship missile system produced by McDonnell Douglas. Originally developed for the Navy to serve as its basic anti-ship missile for fleetwide use on ships, submarines and aircraft, it also has been adapted for use on Strategic Air Command B-52G bombers.

The Harpoon's low-level, sea-skimming cruise trajectory, active radar guidance, counter-countermeasures capability, and warhead design assure high survivability and effectiveness.

First delivered to Strategic Air Command in 1985, the missile is currently operational in two Strategic Air Command B-52G wings: the 42nd Bombardment Wing, Loring Air Force Base, Maine; and the 43rd Bombardment Wing, Andersen Air Force Base, Guam. The very long range of the B-52G enables Strategic Air Command to work closely with the Navy to interdict shipping well beyond the range possible with other aircraft.

Specifications

Primary function: air-to-surface, anti-ship missile
Prime contractor: McDonnell Douglas
Dimensions: length 12 ft. 7 in., diameter 13.5 in.
Weight: 1,145 lbs.
Range: over the horizon
Speed: high subsonic
Guidance: terminal, active radar
Warhead: penetration high-explosive blast
Power plant: Teledyne turbojet, 660 lb. thrust
Status: operational

July 1988

United States Air Force

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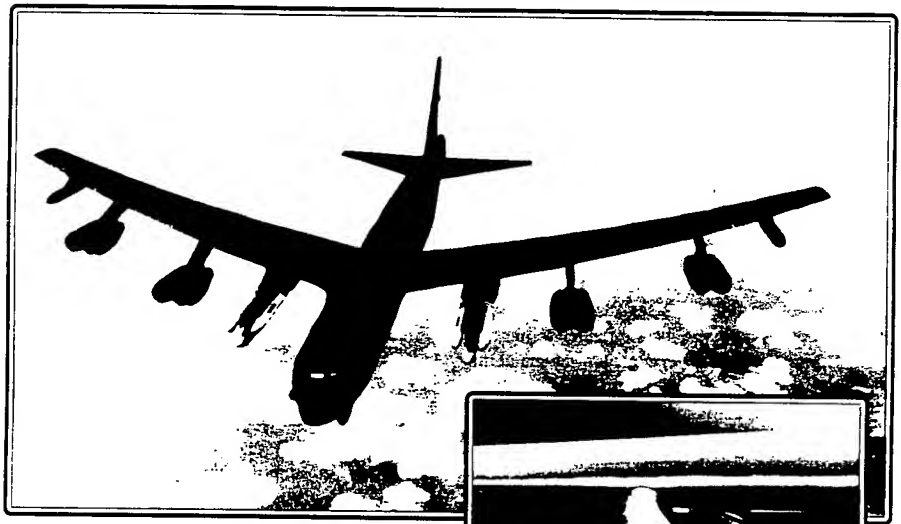
F A C T S H E E T

AGM-86B Air-Launched Cruise Missile

90-10



The Air Force developed the air-launched cruise missile to increase the effectiveness of B-52 aircraft. In combination, they dilute an enemy's forces and complicate defense of its territory.

Background

The foundation of the United States nuclear deterrent force is the strategic triad—intercontinental ballistic missiles, submarine-launched ballistic missiles and manned bombers. For more than three decades, B-52 bombers have served as the mainstay of the strategic bomber force. Deployment of the

AGM-86B, a compatible air-launched cruise missile, greatly enhanced the B-52s' capabilities and helps America maintain a strategic nuclear deterrent.

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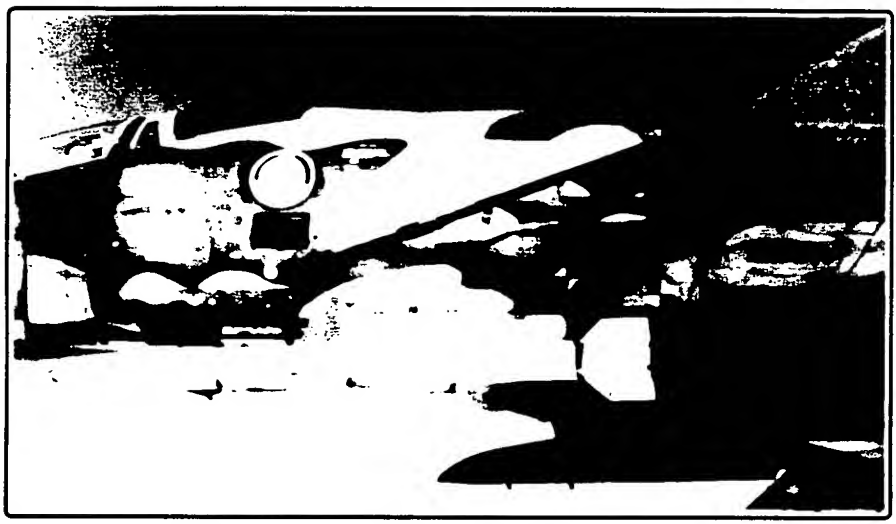
F A C T S H E E T

AGM-88 High-Speed Anti-Radiation Missile 90-03



The AGM-88 high-speed, anti-radiation missile with high-explosive warhead.

Background

The AGM-88 air-to-surface tactical missile is designed to seek out and destroy enemy radar-equipped air defense systems. It can detect, attack and destroy a target with minimum aircrew input. The proportional guidance system that homes in on enemy radar emissions has a fixed antenna and seeker head in the missile's nose. A smokeless, solid-propellant, dual-thrust rocket motor propels the missile.

The Air Force has equipped the F-4G Wild Weasel with the AGM-88 to increase the F-4G's lethality in electronic combat. The missile works in conjunction with the APR-47 radar attack and warning system on the F-4G Wild Weasel. The APR-47 detects functioning enemy radars, and displays and classifies the targets for the aircrew. After the missile is fired, its guidance system takes over and further aircrew involvement is not needed.

The Air Force also has integrated the AGM-88 on the F-16 Fighting Falcon. F-16s carrying the missile may operate in conjunction with the F-4G.

The AGM-88 missile was approved for full production by the Defense Systems Acquisition Review Council in March 1983. It is operationally deployed throughout the USAF tactical air force and in full production as a joint U.S. Navy-U.S. Air Force project.

The AGM-88 missile was developed through Vietnam combat experience. Radar systems for enemy surface-to-air missiles detected the approach of United States anti-radiation missiles and sometimes ceased operation before the missiles could reach them.

Specifications

Prime Function: Air-to-surface anti-radiation missile

Prime Contractor: Texas Instruments

Power Plant/Manufacturer: Thiokol dual-thrust rocket motor

Guidance: Proportional guidance system

Warhead: High-explosive

Dimensions: Wingspan 3 ft. 8 in., length 13 ft. 8 in., diameter 10 in.

Weight: 800 lb.

Range: More than 10 miles

Status: Operational

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Employment

The B-52 and the AGM-86B increase flexibility to attack targets. AGM-86B missiles can be air-launched in large numbers by the bomber force. B-52G and H bombers carry six AGM-86B missiles on each of two externally mounted pylons. B-52H aircraft have been modified with a bomb bay rotary launcher for eight additional air-launched cruise missiles.

An enemy force would have to counterattack each of the missiles, making defense against them costly and complicated. The enemy's defenses are further hampered by the missiles' small size and low-altitude flight capability, which makes them difficult to detect on radar.

Description

The small, winged AGM-86B is powered by a turbofan jet engine that propels it at sustained subsonic speeds. After its launch from a parent aircraft, its folded wings, tail surfaces, and engine inlet deploy. It then is able to fly complicated routes to a target through use of a terrain contour-matching guidance system. During flight, this system compares surface characteristics with maps of the planned flight route stored in on-board computers to determine the missile's location. As the missile nears its target, comparisons become more specific, thereby guiding the missile to target with pinpoint accuracy. The A in AGM is the Department of Defense designation for air-launched; G indicates surface attack; and M indicates guided missile.

History

In February 1974, the Air Force contracted to develop and flight-test the prototype AGM-86A air-launched cruise missile. However, it never reached the operational stage. In January 1977, the secretary of defense directed the Air Force to begin full-scale development of the AGM-86B. Production of the initial 225 AGM-86B missiles began in fiscal year 1980. Production of a total 1,715 of the missiles was completed in October 1986.

Air-launched cruise missiles became initially operational in December 1982 in the 416th Bombardment Wing at Griffiss Air Force Base, N.Y. Other wings now equipped with air-launched cruise missiles include the 379th Bombardment Wing, Wurtsmith Air Force Base, Mich.; 2nd Bombardment Wing, Barksdale Air Force Base, La.; 92nd Bombardment Wing, Fairchild Air Force Base, Wash.; 97th Bombardment Wing, Eaker Air Force Base, Ark.; 7th Bombardment Wing, Carswell Air Force Base, Texas; and 5th Bombardment Wing, Minot Air Force Base, N.D.

Specifications

Primary Function: Air-to-surface strategic missile.

Prime Contractor: Boeing Aerospace Co.

Power Plant/Manufacturer: Williams Research Corp. F-107-WR-10 turbofan engine.

Thrust: 600 lb.

Dimensions: Wingspan 12 ft.; length 20 ft. 9 in., body diameter 24 1/2 in.

Guidance: Litton inertial navigation element with terrain contour-matching updates.

Warhead: Nuclear capable.

Speed: About 550 mph.

Range: More than 1,500 mi.

Weigh: 3,150 lb.

Status: Operational.

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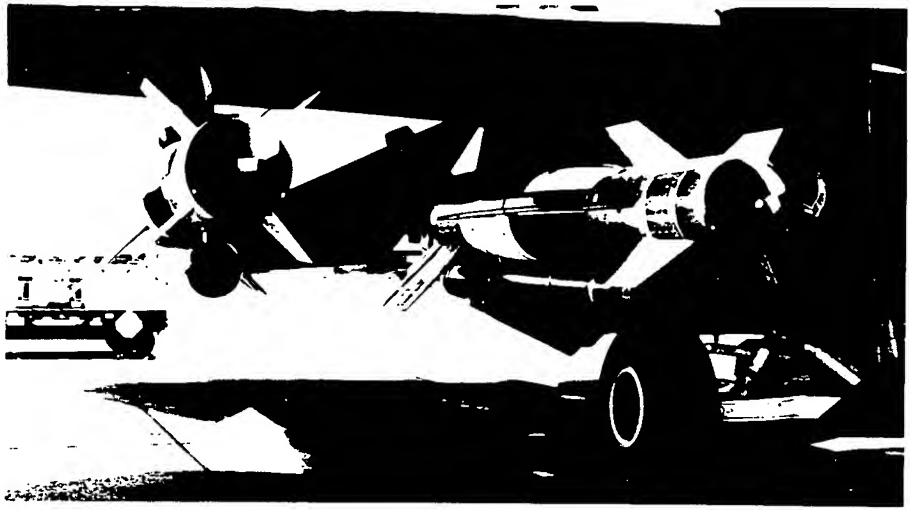

AGM-130A Missile

The AGM-130A is a powered air-to-surface missile designed for low-altitude strikes at standoff ranges against a variety of targets. Carrying forward the modular concept of the GBU-15 guided weapon system, the AGM-130A employs a rocket motor for extended range, and an altimeter for altitude control. The AGM-130A will provide a significantly increased standoff range beyond that of the GBU-15.

The AGM-130A is equipped with either a television or an imaging infrared seeker, and data link. The seeker provides the launch aircraft with a visual presentation of the target as seen from the weapon. During free flight, this presentation is transmitted by a data link system to the aircraft cockpit monitor.

The seeker can be either locked onto the target before or after launch for automatic weapon guidance, or it can be manually steered by the weapon system operator. Manual steering is performed through the two-way data link.

The AGM-130A may be used in either a direct or indirect attack mode. In a direct attack, the pilot selects a target before launch, locks the weapon guidance system onto it and launches the weapon. The weapon automatically guides itself to the target, enabling the pilot to leave the area. In an indirect attack, the weapon is guided by remote control after launch. The remote guidance is provided through the data link by the launching aircraft or by a second aircraft located at a standoff distance.

For the primary mode of operation, which is indirect attack, the aircraft flies to a pre-briefed launch position. Survivability of aircraft and crew is enhanced by launching the weapon at low altitude and significant standoff range, thus avoiding detection by enemy air defenses. After launch, the weapon flies through glide-powered-glide phases toward the target area with midcourse guidance updates provided as necessary through the data link. Upon termination of the powered flight phase, the rocket motor

is ejected. As the target comes into view, the weapon system operator has dual flexibility in guiding the weapon via the data link. For automatic terminal homing, the guidance tracker is locked on target but can be manually updated for precision bombing. When total manual guidance is used, the operator manually guides the weapon to the desired target aimpoint. For those aircraft not equipped with a data link pod, the weapon may be launched in the direct attack mode.

The AGM-130A is designed to be used with the F-4E, F-111 and F-15E aircraft. Development of the AGM-130A began in 1984 as a product improvement of the GBU-15 guided glide bomb.

Specifications

Primary function: air-to-surface guided and powered bomb
Prime contractor: Rockwell International Corp.
Dimensions: wingspan 59 in., length 154-1/2 in., diameter 18 in.
Guidance: television or imaging infrared seeker
Warhead: MK-84 general purpose bomb
Speed: Mach .6 to Mach .9
Ceiling: above 30,000 ft.
Launch weight: 2917 lbs.
Status: in full-scale development

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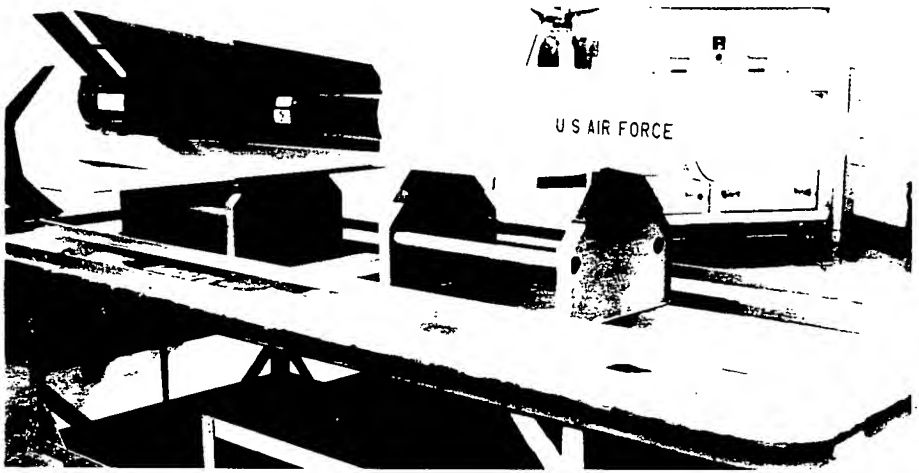

AIM-4 Falcon

The AIM-4 Falcon was the first air-to-air guided weapon to enter service with the U.S. Air Force. The missile is propelled by a solid-propellant rocket motor at supersonic speeds and has a high-explosive warhead.

The sophisticated AIM-4F model has a highly accurate radar system while the AIM-4G model uses the infrared (heat-seeking) target-sensing system. As soon as a pilot confirms target acquisition by the Falcon, he or she launches the missile. The Falcon accelerates to supersonic speed, guides on the target and destroys it.

Falcons became operational in 1955. Ten versions have since been produced and carried by F-89, F-101, F-102, F-106 and F-4 aircraft. Various models continue to be carried by Tactical Air Command and Air National Guard interceptor aircraft.

The initial production version of the missile, the GAR-1, had semiactive radar guidance. About 4,000 of these were delivered to the Air Force.

The AIM-4A Falcon (formerly GAR-1D) was similar to the GAR-1 but had improvements that gave it better performance and maneuverability. About 12,000 were built from 1956 until production ended in 1959. The A model was phased out in 1977.

About 9,500 AIM-4C (formerly GAR-2A) missiles were delivered simultaneously with the A models. The C version, no longer in service, was similar to the A, but had an infrared seeker behind a transparent nose dome. Immediately behind the nose was a set of four miniature fins. Four long, narrow delta wings began slightly behind the center point of the missile.

The AIM-4F/G models are improved versions of the AIM-4A/C missiles with higher speed and ceiling, and greater range. The two versions were introduced simultaneously in 1960, superseding the interim AIM-4E version, which is no longer in service. The AIM-4F G has an aerodynamic nose, an increased wingspan and no nose fins. These models have a solid-propellant, two-stage Thiokol M46 rocket motor. The F model has a semiactive

radar guidance system less susceptible to enemy electronic countermeasures. The AIM-4G has an infrared guidance system. Tactical Air Command and Air National Guard F-106 Delta Darts are armed with a mixed load of AIM-4F and AIM-4G missiles.

The AIM-4D was received by the Air Force in 1963. It was a crossbred version that combined the improved infrared seeker of the AIM-4G with the basic airframe of the AIM-4C. The D model was propelled by a Thiokol M-58-E-4 solid-propellant rocket motor that had 6,000 pounds of thrust.

The D model armed the F-101 Voodoo interceptor aircraft; both the AIM-4D and the F-101 have been phased out. A nuclear version of the Falcon, the AIM-26A, was the first guided air-to-air missile with a nuclear warhead to enter service with the Air Force. The AIM-26B Falcon was similar to the A but had a conventional warhead. AIM-26A and B missiles are no longer in the active inventory.

Specifications

Primary function: air-to-air guided missile
Prime contractor: Hughes Aircraft Co.
Power plant/manufacturer: AIM-4F/G — Thiokol M46 solid-propellant rocket motor
Thrust: AIM-4F/G — 6,000 lb.
Guidance: AIM-4F — Hughes semiactive radar guidance system; AIM-4G — infrared guidance system
Dimensions: length AIM-4F — 7 ft. 2 in., AIM-4G — 6 ft. 9 in.; body diameter AIM-4F G — 6 3 5 in; wingspan AIM-4F/G — 2 ft.
Warhead: high-explosive
Launch Weight: AIM-4F — 150 lb.; AIM-4G — 145 lb.
Status: operational (F-106 and AIM-4F G scheduled for retirement in fiscal year 1988)

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89-23

AIM–7 Sparrow Missile

The AIM-7 Sparrow is a radar-guided, air-to-air missile with a high-explosive warhead. The versatile Sparrow has all-weather, all-altitude operational capability and can attack high-performance aircraft and missiles from any direction. It is a widely deployed missile used by U.S. and NATO air forces.

The missile has five major sections: radome, radar guidance system, warhead, flight control (autopilot plus hydraulic control system) and solid-propellant rocket motor. It has a cylindrical body with four wings at mid-body and four tail fins. Although external dimensions of the Sparrow remain relatively unchanged from model to model, the internal components of newer missiles represent major improvements with vastly increased capabilities.

The AIM-7E-2 is an improved version of the E-model. It is called the "dog-fight modification" because of increased maneuverability at short range. It provides tactical air forces a missile better suited for close-in visual engagements.

The AIM-7E-3 model has improved reliability and target sensing over the AIM-7E-2. AIM-7E-3s are in service with F-4 Phantom aircraft.

The AIM-7F joined the Air Force inventory in 1976 as the primary medium-range, air-to-air missile for the F-15 Eagle. The F-model is equipped with a solid-state guidance system that enables it to carry a larger warhead and be propelled by a booster's sustainer-type rocket motor that increases its range.

The AIM-7M entered service in 1982. It has improved reliability and performance at low altitudes, and in electronic countermeasures environments. Also, it has a significantly more lethal warhead. The latest software version of the AIM-7M is H-Build. H-Build has been produced since 1987 and incorporates additional improvements in guidance and fuzing. The F-15 Eagle and F-16 Fighting Falcon air-defense fighters carry the AIM-7M Sparrow.

The U.S. and NATO navies operate a surface-to-air version of this missile called the RIM-7F/M Sea Sparrow.

Specifications (AIM-7F/M)

Primary function: air-to-air guided missile
Prime contractor: Raytheon Co.
Power plant manufacturer: Hercules MK-58 solid-propellant rocket motor
Dimensions: wingspan 3 ft. 4 in., length 12 ft., diameter 8 in.
Warhead: high-explosive
Launch weight: approximately 500 lbs.
Guidance system: Raytheon semiactive on either continuous wave or pulsed Doppler radar energy
Status: operational

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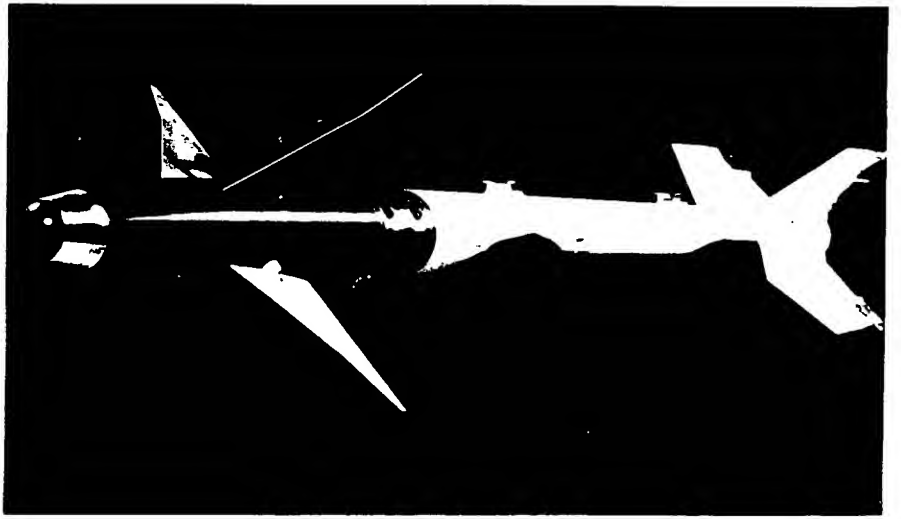

AIM-9 Sidewinder

The AIM-9 Sidewinder is a supersonic, heat-seeking, air-to-air missile carried by fighter aircraft. It has a high-explosive warhead and an active infrared guidance system. The Sidewinder was developed by the U.S. Navy for fleet air defense and was adapted by the U.S. Air Force for tactical fighter use. Early versions of the missile were utilized extensively in the Southeast Asian conflict.

The AIM-9 has a cylindrical body with a roll-stabilizing rear wing/rolleron assembly. Also, it has detachable, double-delta control surfaces behind the nose that improve the missile's maneuverability. Both rollerons and control surfaces are in a cross-like arrangement.

The missile's main components are an infrared homing guidance section, an active optical target detector, a high-explosive warhead and a rocket motor.

The infrared guidance head enables the missile to home on target aircraft engine exhaust. An infrared unit costs less than other types of guidance systems, and can be used in all-weather and electronic countermeasures conditions. The infrared seeker also permits the pilot to launch the missile, then leave the area or take evasive action while the missile guides itself to the target.

The AIM-9A, prototype of the Sidewinder, was first fired successfully in September 1953. The initial production version, designated AIM-9B, entered the Air

Force inventory in 1956 and was effective only at close range. It could not engage targets close to the ground, nor did it have all-weather or head-on attack capability. These shortcomings were eliminated on subsequent versions of the Sidewinder.

The following versions of the AIM-9 Sidewinder are currently operational:

The AIM-9E has an improved guidance and control system, and the B model's former blunted nose is more tapered. This model has greater range and enhanced low-altitude capability against maneuvering targets. Some E models are equipped with reduced-smoke rocket motors and have the designation AIM-9E-2. It joined the Air Force inventory in 1967.

The AIM-9J, a conversion of the AIM-B and E models, has maneuvering capability for dogfighting, and greater speed and range, giving it greater enhanced aerial combat capability. Deliveries began in 1977 to equip the F-15 and other Sidewinder-compatible aircraft.

The AIM-9L has a more powerful solid-propellant rocket motor as well as improved tracking maneuvering ability. An improved active optical fuze increases the missile's lethality and resistance to electronic countermeasures. An AM-FM conical scan increases seeker sensitivity and improves tracking stability. The L model is the first Sidewinder with the ability to attack from all angles, including head on. Production and delivery of the AIM-9L began in 1976.

The AIM-9M, a variant of the AIM-9L, has the all-aspect capability of the L model but provides all-around higher performance. The M model has improved defense against infrared countermeasures, enhanced background discrimination capability and a reduced-smoke rocket motor. These modifications increase ability to locate and lock-on a target and decrease the missile's chances for detection. Deliveries began in 1983.

The AIM-P, an improved version of the J model, has greater engagement boundaries, enabling it to be launched farther from the target. The more maneuverable P model also has improved solid-state electronics that increase reliability and maintainability. Deliveries began in 1978.

The AIM-9P-1 has an active optical target detector instead of the infrared influence fuze; the AIM-9P-2 has a reduced-smoke motor. The most recently developed version, the AIM-9P-3, has both the infrared fuze and the reduced-smoke motor. It also has added mechanical strengthening to the warhead as well as the guidance and control section. The improved warhead uses new explosive material that is less sensitive to high temperature and has a longer shelf life.

Specifications

Primary function: air-to-air tactical missile
Prime contractor: Naval Weapons Center
Power plant/manufacturer: Hercules and Bermite Mk 36 Mod 7, 8 solid-propellant rocket motor
Guidance: solid-state, infrared homing system
Dimensions: finspan 2 ft. 3/4 in.; length 9 ft. 5 in., body diameter 5 in.
Warhead: annular blast fragmentation warhead
Launch weight: 190 lb.
Status: operational

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Fact Sheet

United States Air Force

Secretary of the Air Force, Office of Public Affairs, Washington, D.C. 20330-1000

87-5

AIM-120A Advanced Medium Range Air-to-Air Missile

The AIM-120A Advanced Medium Range Air-to-Air Missile (AMRAAM), is a new generation air-to-air missile. It has an all-weather, beyond-visual-range capability and is scheduled to be operational from 1989 to beyond the year 2000. The AMRAAM will be procured for the U.S. Air Force, Navy, and America's European allies.

The AMRAAM program will improve the aerial combat capabilities of U.S. and allied aircraft to meet the future threat of enemy air-to-air weapons. AMRAAM will be compatible with the Air Force F-15 and F-16, Navy F-14 D/D (R) and F/A-18 C/D, German F-4, and the British Tornado and Sea Harrier aircraft.

AMRAAM will serve as a follow-on to the current AIM-7 Sparrow missile series. The new missile will be faster, smaller and lighter, and have improved capabilities against low-altitude targets. It also incorporates an active radar in conjunction with an inertial reference unit and micro-computer system, which makes the missile less dependent upon the fire control system of the aircraft. Once the missile closes in on the target, its active radar guides it to intercept. This enables the pilot to aim and fire several missiles simultaneously at multiple and centered targets. The pilot may then perform evasive maneuvers while the missiles guide themselves to the targets.

In August 1980, the defense departments of the Federal Republic of Germany, the United Kingdom, France and the United States signed a memorandum of understanding to develop and produce air-to-air missiles. The memorandum provided for the United States to develop AMRAAM and a European consortium to develop the Advanced Short Range Air-to-Air Missile (ASRAAM). The joint approach to international defense cooperation was to provide improved air-to-air missiles, aid cross-servicing of armaments within the European theater, enhance interoperability among aircraft from various nations and substantially reduce procurement costs for the countries involved.

The AMRAAM program completed its conceptual phase in February 1979 when the U.S. Air Force selected two of five competing contractors, Hughes Aircraft Co. and Raytheon Co., to continue into the validation phase.

During the 33-month validation phase, the contractors continued missile development by building actual hardware to demonstrate their technological concepts. The program phase concluded in December 1981 after both contractors demonstrated that their flight test missiles could satisfy Air Force and Navy requirements. The Air Force competitively selected Hughes Aircraft Co.'s Missile Systems Group, Canoga Park, Calif., as the full-scale developer.

During the full-scale development phase, Hughes Aircraft Co. was to complete missile development and plan an orderly transition into production. A

total of 98 test vehicles will be launched during flight tests, which are to be conducted at Eglin AFB, Fla.; White Sands Missile Range, N.M.; and Point Mugu, Calif. Full-scale development is expected to be complete in 1988.

Production is scheduled to begin in the third quarter of fiscal year 1987 and continue into the 1990s. Approximately 24,000 missiles will be produced.

Specifications

Primary function: air-to-air tactical missile
Prime contractor: Hughes/Raytheon
Speed: supersonic
Guidance: active radar terminal/inertial midcourse
Dimensions: length 143.9 in.; wingspan 20.7 in.; diameter 7 in.
Warhead: blast fragmentation
Launch Weight: 335 lbs.
Status: Full-scale development

United States Air Force

Secretary of the Air Force, Office of Public Affairs, Washington, D.C. 20330-1000

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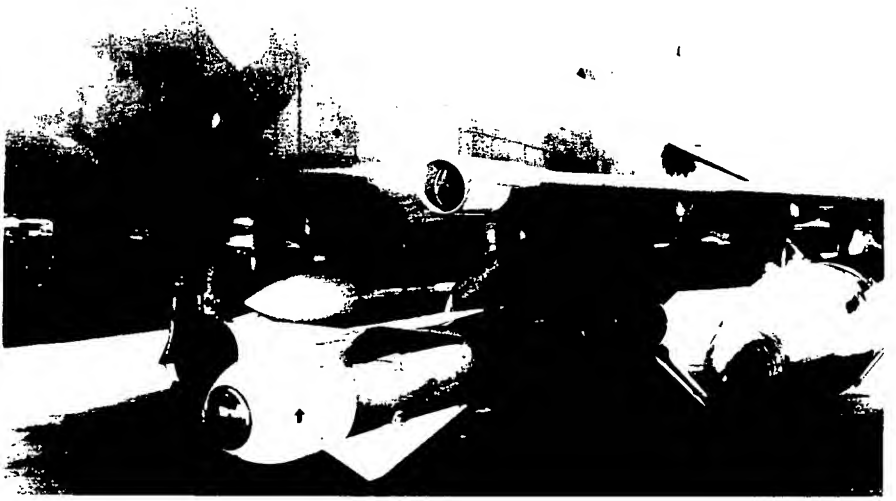

GBU-15

The GBU-15 is an air-to-surface guided glide bomb. This unpowered weapon is used to suppress enemy defenses and destroy enemy targets. The bomb has modular elements consisting of various interchangeable guidance, fuzing and control systems designed to meet specific mission requirements.

Each weapon has six components: a forward guidance section, warhead adapter section, warhead section, fuze adapter, airfoil components and a weapon data link.

The guidance section is in the nose of the weapon. It can be a television guidance system for daytime and an imaging infrared system for night or limited adverse weather operations. A data link in the tail section sends continuous guidance updates to the control aircraft that enables the weapon systems operator to guide the bomb by remote control to its intended target.

The warhead section contains a general purpose bomb. It also has an external electrical conduit and an umbilical receptacle. The conduit carries electrical signals between the guidance and control sections. The umbilical receptacle passes guidance and control data between cockpit control systems of the launching aircraft and the weapon prior to launch.

The rear control section consists of a cylindrical body with wings. The four wings are in a cross-like arrangement and have trailing edge flap control surfaces for flight maneuvering. The weapon system batteries and flight control components also are located in this section. Part of the flight control system, the autopilot, collects

steering data from the guidance section and converts the information into signals that move the wing control surfaces to change the weapon's flight path.

The GBU-15 may be used in direct or indirect attack. In a direct attack, the pilot selects a target before launch, locks the weapon guidance system onto it and launches the weapon. The weapon automatically guides itself to the target, enabling the pilot to leave the area.

In an indirect attack, the weapon is guided by remote control after launch. The pilot fires the weapon that glides briefly until the pilot locks it on a target. As the weapon flies to the target, the pilot changes its flightpath as necessary, based on data-link guidance updates.

This highly maneuverable weapon has an optimal low-to-medium altitude delivery capability with pinpoint accuracy. It also has a standoff capability.

The GBU-15 is designed to be used with the F-4 Phantom II and the F-111. Selected F-15s also carry the weapon.

Air Force Systems Command's Armament Division, at Eglin Air Force Base, Fla., began developing the GBU-15 in 1974. It was a product improvement of the early guided bombs used during the conflict in Southeast Asia. Flight-testing of the weapon began in 1975. The GBU-15 with television guidance completed full-scale operational test and evaluation in November 1983, and in February 1985 initial operational test and evaluation was completed on the imaging infrared guidance seeker.

In December 1987, the program management responsibility for the GBU-15 weapon system transferred from the Air Force Systems Command to the Air Force Logistics Command.

Specifications

Primary function: air-to-surface guided glide bomb
Prime contractor: Rockwell International Corp.
Dimensions: wingspan 4 ft. 11 in., length 12 ft. 10 1/2 in., diameter 1 ft. 6 in.
Guidance: television or imaging infrared seeker
Warhead: Mk-84 general purpose bombs
Speed: Mach .6 to Mach .9
Ceiling: above 30,000 ft.
Launch weight: 2,500 lb.
Status: operational

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